AMC SAFETY DIGEST

FIRE PREVENTION WEEK
OCTOBER 3-9 1971

AMCP 385-103

SEPTEMBER 1971

Presidential Documents

Title 3—The President

PROCLAMATION 4059

Fire Prevention Week, 1971

By the President of the United States of America

A Proclamation

Despite unparalleled technological advances in many areas of our society, uncontrolled fires continue to bring a great deal of tragedy and widespread loss to our Nation. Fires now kill more than 12,000 persons each year and cause annual property losses exceeding $2 billion.

The most shameful aspect of this terrible waste is that it is so unnecessary. Most fires are caused by carelessness, by lack of knowledge, or by hazardous conditions—all of which can be eliminated. But while we all give occasional lip-service to the importance of fire prevention, our deeds too often fail to match our words—and so the loss continues.

But this pattern need not continue. If each of us will only focus his attention on the practical implications of fire prevention in his daily life, a great deal can be done to reduce the destruction caused by fires.

NOW, THEREFORE, I, RICHARD NIXON, President of the United States of America, do hereby designate the week beginning October 3, 1971, as Fire Prevention Week.

I call upon all citizens to participate in the fire prevention activities of their various governments, of community fire departments, and of the National Fire Protection Association. Every person should be alert to the ways in which he can eliminate fire hazards. Every citizen should learn how to report fires, how to use basic extinguishing agents and firefighting techniques, and how to react when major fires strike his place of work or his residence. The need to rethink all of these matters is especially important as new technologies change our living environments and the nature of the fire risks we encounter.

I also encourage all Federal agencies, in cooperation with the Federal Fire Council, to conduct effective fire prevention programs, including fire exit drills and other means of training employees, in order to help reduce this waste of life and resources which now plagues our Nation.

IN WITNESS WHEREOF, I have hereunto set my hand this seventh day of June in the year of our Lord nineteen hundred seventy-one, and of the Independence of the United States of America the one hundred ninety-fifth.

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY MATERIEL COMMAND
WASHINGTON, D.C. 20315

16 July 1971

TO ALL MEMBERS OF THE US ARMY MATERIEL COMMAND

On 1 August 1962, the Army Materiel Command came into being to fulfill the demanding logistical needs of our Modern Army. The intervening nine years have brought us many challenges -- challenges which have been successfully met, due to the dedication, determination, and skill of each of you.

Relatively young in relation to the rest of the Army, the US Army Materiel Command inherited a tradition of excellence from the Technical Services which extends back to the earliest days of our Nation. Building on that proud tradition, USAMC has forged a record of logistics response to the needs of the fighting man that is unparalleled.

Our initial phase of consolidation and organization was interrupted by the demands of the Cuban crisis, and by the war in Southeast Asia. Through your magnificent efforts, USAMC met these requirements in an outstanding manner. I know that you share with me a deep sense of pride in our many accomplishments, and in belonging to a professional "can do" organization, recognized as an indispensable part of the Army team.

We are now entering a retrenchment phase, as the war in Southeast Asia comes to an end. During this period of decreasing resources, we are exerting our best efforts to establish and maintain a viable and dynamic logistical base for the Army. Measurable progress toward this goal is already evident by such innovative steps as the establishment of systems for Direct Supply Support, Selected Items Management, Depot Central Workloading, and by our determined effort to improve the Materiel Acquisition Process. I know that you will continue to apply your ingenuity and zeal as we strive to develop a modern responsive organization, perfectly attuned for the Seventies.

I express my sincere appreciation for your loyal support, and for what you have achieved. I am counting on your continued splendid efforts as we begin our tenth year of service to the men and women of the US Army.

HENRY A. MILEY, JR.
General, United States Army
Commanding

HEADQUARTERS
UNITED STATES ARMY MATERIEL COMMAND
WASHINGTON, D.C. 20315

AMC PAMPHLET Number 385-103 SEPTEMBER 1971

The Safety Digest is an AMC Pamphlet prepared by the Safety Office, Headquarters, U. S. Army Materiel Command. Its purpose is to disseminate information which can materially influence and improve safety programs at all Command establishments.

Articles are included to supplement technical knowledge as well as practical knowledge gained through experience. They provide a basis for the further refinement of safety measures already incorporated in operating procedures and process layout. To achieve maximum effectiveness, the Safety Digest should be given widespread circulation at each AMC establishment.

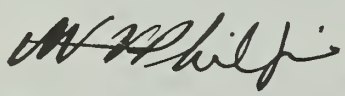
Articles appearing in the Safety Digest are unclassified and are not copyrighted. They may be reproduced as desired in order to bring pertinent accident prevention information to the attention of all employees. The Army Materiel Command Safety Digest should be given a credit line when articles are extracted.

Unclassified material believed to be of interest or benefit to other establishments is welcome for publication in the Safety Digest. Please send articles for review to: U. S. Army Materiel Command Field Safety Agency, Charlestown, Indiana. If possible, include pictures, charts, drawings, and illustrations that clarify and heighten interest in your presentation.

(AMCSF)

FOR THE COMMANDER:

OFFICIAL:



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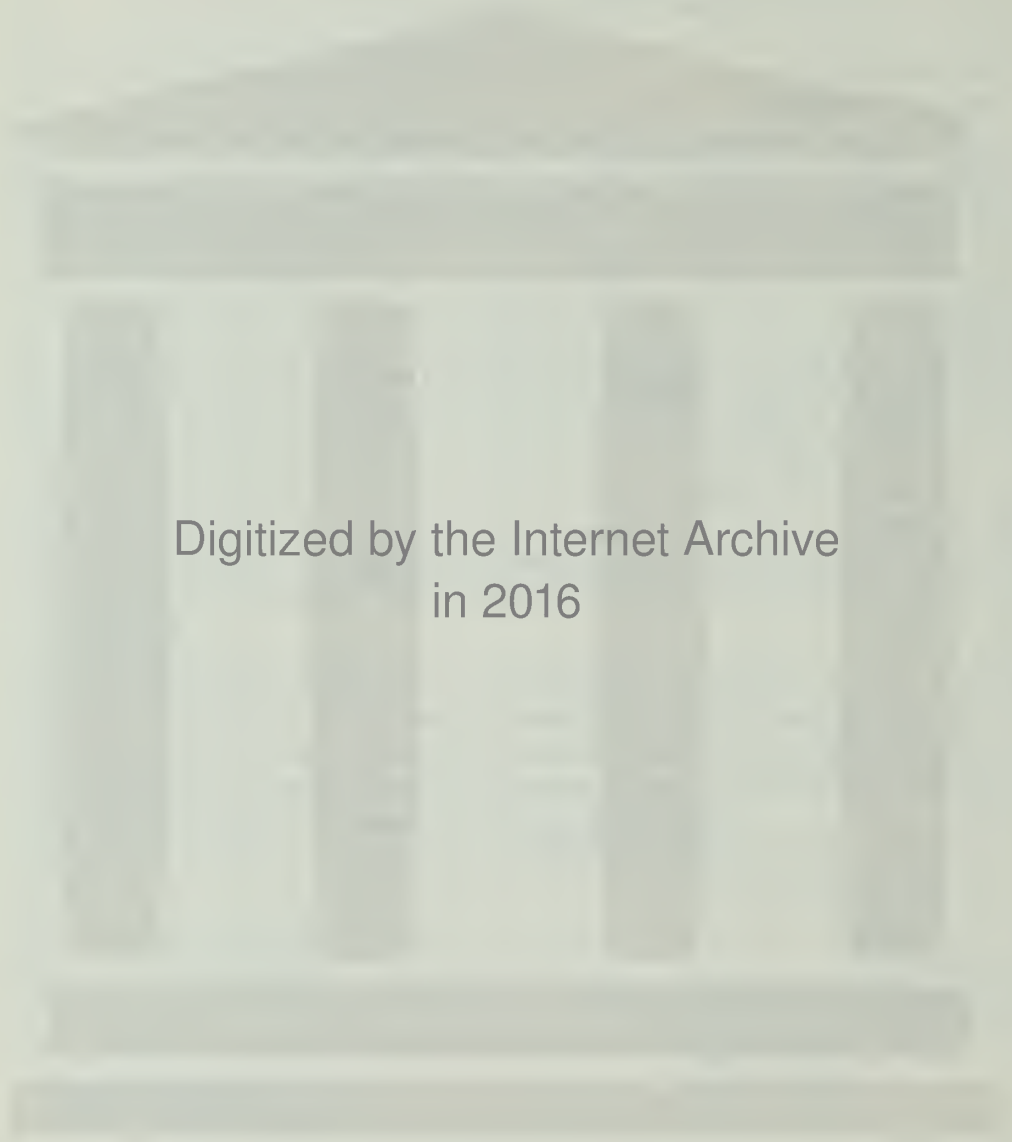

HOME FIRE PREVENTION

Fire Prevention Week is 3 October through 9 October 1971. Although every day should include fire prevention and safety activities, this week should include a cleanup of unnecessary trash accumulations about the home, and a check, and correction, of existing fire hazards.

Fire ranks second as a cause of death among all types of home accidents, and a high percentage of total deaths each year occur in one and two family dwellings.

The following is a list of prevention actions to minimize fire hazards in your home.

Don't smoke in bed.

Keep matches and lighters out of reach of small children.

Provide large deep ashtrays that hold cigarettes and cigars securely.

Dispose of ashes safely before retiring for the night.

Select furnishings and bedding that are less likely to be ignited and burned.

Check wiring in house and have it re-wired unless adequate.

Have worn and damaged electric cords, and defective appliances repaired or replaced immediately.

Never attach too many appliances on one circuit.

Use proper size cords for type of appliance.

Do not use extension cords in lieu of permanent wiring.

Never use makeshift fuses or ones with higher ratings than the circuit rating.

Keep only small quantities of flammable liquids in the home.

Store flammable liquids in safety cans.

Clearly label containers.

Do not do home dry cleaning with gasoline or naphtha.

Never rekindle a fire with gasoline or kerosene.

Have heating equipment, chimneys, and flues checked in summer so they are in excellent operating condition when cold weather arrives.

Provide doors at head of basement or lower stairs where heating equipment is located.

If door is kept closed at all times, it could keep a fire from spreading.

Protect floors, walls, ceilings, and partitions near furnace, stove, or heating pipes with adequate noncombustible materials or air space.

Exercise special caution when using portable heating equipment, or replace heaters with recessed-wall or other safe types of heating equipment.

Select curtains, drapes, upholstery, and rugs made of fibers that are less flammable.

If possible, when building or remodeling, select materials for walls, ceilings, floors, and partitions that have been treated to make them fire-retardant.

Fill hollow walls with fire-resistant insulation, and put fire stops in between doors.

Use solid doors on bedrooms and at tops of stairways.

Paint existing doors with fire-retardant paint.

Have an alternate emergency escape for every room.

Extracted from
National Safety News

THE MATERIEL NEED

Earlier articles ("An Introduction to System Safety," AMC Safety Digest, November 1970; and "System Safety Program Requirements, Planning and Management," AMC Safety Digest, January 1971) discussed the concept of a life cycle for system development and its corresponding safety input.

Since the publication of the above articles, a new idea has been formulated which significantly affects the way in which Army materiel will be developed. The following is a synopsis of the "new" life cycle management model (LCMM).

AMC, in conjunction with the Combat Developments Command (CDC), has developed a single requirements document, the materiel need (MN), to aid the Army in its process of materiel acquisition. In general, the principal points of the MN concept are:

1. It uses a single document, an MN, with a single format to establish the need for new or improved items/systems for the Army and to provide guidance to the materiel developer throughout the life cycle of materiel. As developed, the MN will replace the current requirements documents; e.g., the QMDO, QMR, and SDR.

2. Joint face-to-face meetings between CDC and AMC are required at many additional major decision points in the materiel life cycle.

3. The documentation processing time will be reduced from two and one-half years to 60 weeks.

4. The DA LCMM has been reduced from 239 to 153 milestones.

5. Characteristics in materiel needs will be prepared as bands of performance, within which it is sensible to optimize the overall system. As long as the development does not go outside these levels, it will not be necessary to revise the MN, and the resulting items will be operationally acceptable to the CDC.

6. External or worldwide coordination of the MN will occur only once in the life cycle.

7. All MN's will go completely through the concept formulation phase.

8. MN's will be revised as necessary throughout the life cycle, based on information gained in concept formulation, contract definition, engineering development, testing and production, and by changes which occur in the threat, concept of use, technology, costs and time to develop.

9. A final detailed definition of the item is not stated until completion of the development and testing phases.

10. At any time during the life cycle that an impasse is reached between the subordinate elements of the combat and materiel developers as to what course to follow, these problems will be referred to the CG's for resolution within 30 days from the time they became known.

The materiel need, as approved by DA on 25 November 1970, for implementation throughout the Army, is defined as: "A DA-approved statement of a need for new or major or improved materiel to provide an initial operational capability by a specified time frame, without regard to a particular technical approach or solution." This definition is put into a "working" form via the following format. The major sections include:

1. Section I - Statement of Materiel Need
    a. Title
    b. Capability Needed and Time Frame
2. Section II - Justification
    a. Threat
    b. Operational Deficiency
    c. Supporting Documentation Cited
3. Section III - Operational Concept
4. Section IV - Organizational Concept
5. Section V - Logistical Concept
6. Section VI - Characteristics
    a. Performance
    b. Physical
    c. Maintenance
    d. Human Factors
    e. Priority of Characteristics
7. Section VII - Personnel and Training Considerations
8. Section VIII - Associated Considerations

It is of interest to the safety professional that safety has been included as part of the physical characteristics (6b above).

The impact of this new concept is such that major changes have been made in certain portions of the LCMM for Army Systems prescribed in DA Pamphlet 11-25. While the principal changes are in the concept formulation phase, changes have also been made in the contract definition, development and production, and operations and disposal phases to be consistent in the portrayal of the joint activities of the combat and materiel developers. Also, as discussed above, the number of blocks, or milestones, has been reduced. This reduction, however, has not affected the assigned responsibilities of any DA staff elements or major commands. It has resulted from the combination of blocks pertaining to one action; e.g., combining DA policy and decision blocks into a single block, combining IPR and SSE blocks into a single block and elimination of program element blocks.

In the concept formulation phase, an MN is prepared in place of the present QMDO. The MN is prepared jointly by the combat and materiel developers (CD/MD) to insure the statements of characteristics which will prescribe levels of performance take full advantage of available and probable technology within the time frame desired. This is in contrast with the current QMDO activity which is generally conducted independently by this CD/MD. The time frame desired is indicated specifically; e.g., 74-76. In contrast, the current LCMM at the QMDO stage specifies all systems for a given Army Concept Program; e.g., Army "85." Concurrent with the preparation of the MN, the developer prepares the "Technical Plan" which will include identification of all feasible approaches which might provide the capability needed, and the estimated cost and scheduling information for each of the approaches recommended for further R&D effort. The "Technical Plan" replaces the "QMDO Plan." Upon completion of coordination, the MN and "Technical Plan" are submitted to DA for approval of the MN, program plan and recommended budgeting by a joint letter signed by both the CD/MD.

At the time technically feasible solutions to the MN are identified, the materiel developer prepares and submits to the combat developer the Trade-Off Determination (TOD). This TOD replaces the "Parametric Design Study," the "Qualitative Materiel Approach" and the "Trade-Off Study." The TOD, received by the combat developer, also triggers the establishment of a joint team to accomplish the contract definition prerequisites in the case of major systems for which a Project Manager will be required or whose estimated costs exceed $12.5 million RDTE/$50 million PEMA. In the case of minor systems, contract definition prerequisites will be accomplished by joint meetings and/or correspondence between the combat and materiel developers.

Based on the TOD, a Trade-Off Analysis is conducted. Where the TOD cost estimates indicate costs exceeding $12.5 million RDTE/$50 million PEMA or meet the criteria of AR 70-17 for project managers (PM's), the proposed Trade-Offs are analyzed jointly in face-to-face meetings by the combat and materiel developers. For costs less than indicated above, the joint efforts may be accomplished by correspondence as well as meetings. The TOA replaces the "Mission and Performance Envelopes" and the "Trade-Off Analysis."

Recommendations for building components and/or experimental or operational prototypes to prove economic or technical feasibility in advanced development may be made by either the materiel or combat developer as a result of the TOD or TOA. This recommendation replaces the present "Advanced Development Objective (ADO)." At this time also the decision will be made as to whether a PM will be appointed.

Based upon the TOD and TOA, the Best Technical Approach (BTA) is jointly identified in face-to-face efforts. The BTA replaces the present "Best Technical Approach Selected" and "Cost and Schedule Estimates Credible and Acceptable."

The BTA triggers the joint CD/MD Cost and Operational Effectiveness Analysis (COEA). The COEA replaces the present "Cost Effectiveness Analysis."

Satisfaction of the six prerequisites to contract definition results in a Concept Formulation Package (CFP) consisting of the TOD, TOA, BTA and COEA.

The MN is next revised to reflect the information contained in the CFP as an MN(ED) for entry directly into engineering development or into contract definition as appropriate. This action replaces that of developing a QMR in the current LCMM. The materiel developer, together with the combat developer, prepares a Proposed Development Plan (PDP), or System Development Plan (SDP), a Proposed Program Change Request (PPCR) (and the Drift Development Concept Paper (DDCP) when required for major systems). This package, consisting of the MN(ED), PDP, PPCR, CFP (and DDCP when appropriate), is forwarded to DA for approval by a joint letter signed by both the combat and materiel developers recommending entry into engineering or operational systems development programs. This contrasts with today's collaborative but independent actions by the combat, trainer and materiel developers at this highly important decision point.

In the contract definition phase, the decision on proposed Trade-Offs is accomplished jointly by the combat and materiel developers rather than by the materiel developer only in the present system. The revisions to the MN(ED), PCR, SDP, MCP and SD are also accomplished by joint actions rather than the separate actions of the CD/MD in the current system.

In the development and production phase, revisions to the MN(ED) are made as changes become known in the threat, concept of use, technology, costs and time to develop. In the current system the materiel developer, if necessary, updates the SDP (for facility requirements), based on inputs from CONARC and CDC.

Revisions to the master plans and schedules for development are presently made by the materiel developer. The proposed system has the revision to master plans and schedules as a joint action.

At the conclusion of the testing cycle, an MN (Production) (MN(P)) is prepared jointly by the CD/MD. The MN(P) provides the basis for type classification actions and the system description in the production contract. This is in contrast to the present system where the QMR, which may or may not have been revised in accordance with IPR or SSE changes, is used as the basis for type classification actions.

In the operations and disposal phase, there are two other points in the cycle where joint combat/materiel actions are required to provide proper decisions on appropriate courses of action. The review of the performance characteristics in the MN(P), which is based on user tests, is conducted jointly in contrast to the present system where the combat developer does this as an independent action. Also, the recommendation for reduction of items in the system, or elimination of items from the system, is a joint combat/materiel developer action rather than an independent action by the combat developer in the present system.

In summary, the MN concept, which uses a single document with a single format throughout the system, will accomplish a considerable savings in the time devoted to the administrative document processing time required for the present QMDO/QMR process, which also employed a variety of documents, each with its own format.

A further major change under the MN concept is that a requirement as such is not stated until the completion of the development and testing phases. At this time, the MN is revised to reflect single value characteristics which describe the item that was developed, tested, and accepted by the user, and determined to be producible by the materiel developer.

From a safety viewpoint, the need still exists to provide input during all life cycle phases. In conjunction with this, it is necessary that all AMC safety personnel re-orient their thinking to insure that it is properly aligned with the LCMM changes outlined above. Of prime importance here is the fact that life cycle type regulatory documents; e. g., AR's 11-25, 71-1 and 705-5, and DA Pamphlet 11-25, are being revised to encompass these new concepts. Involved safety personnel must be aware of these revisions in order to accurately determine their responsibilities as active members of the system development team.

AUTOROTATION, SI TOUCHDOWN, NO

ROBERT J. MARTIN
Aviation Section
WSMR

Paratroopers have often been chided by their comedian pilot friends with the statement, "Anyone who jumps out of a perfectly good flying aircraft has got to have rocks in his head." If he knew enough about rotary wing flying, the paratrooper might retort, "Anyone who intentionally shuts off the power in a perfectly good flying helicopter and hurls it toward the ground doesn't have any room to critize." To the uninitiated they both have a point. But there is a good reason for these seemingly idiotic practices, and that reason is training - training for the real thing. The question is, how far do you go in training to simulate the real thing? You must go far enough to enable the trainee to cope with any emergency situation he might encounter, but not so far that you endanger life and equipment unnecessarily. "Unnecessarily" is the key word here. Any time emergency procedures are practiced there is an element of risk. For example, while practicing single engine procedures in the U-8, there is always the chance that the other engine will malfunction or that the wrong engine will be feathered. These risks are part of the price to be paid, but safeguards such as sufficient altitude for an engine restart are insisted upon to minimize the accident potential. This is not the case with touchdown autorotations.

Why do we practice autorotations all the way to the ground? When questioned the advocates will tell you that it is a life-saving maneuver and without the actual touchdown, it loses its value as a training aid. Besides it is fun. I DISAGREE THAT IT IS NECESSARY TO GO ALL THE WAY TO THE GROUND. Never? No, I think the fledgling birdman should continue to receive this training as part of the basic and advanced school curriculum with an Instructor Pilot who can rescue him from last second errors. What about checking out in new aircraft? Knowing how the aircraft touches down at the termination of an autorotation comes under the heading of nice to know but not essential. I can hear the howls of anguish coming up from the other camp already.

What is the reason for this heretical point of view? Reading the USABAAR Weekly Summary should answer that question. All too often we read statements such as: "Student and instructor were performing a touchdown autorotation." "On touchdown, the student applies aft cyclic." "The main rotor flexed and struck the tail boom." Or another, "An IP and student were performing an autorotation." "The aircraft landed hard and the main rotor severed the tail rotor drive shaft and antitorque cables." And did you notice something very significant in the Aviation Accident Prevention Questionnaire, which you completed in conjunction with your annual instrument written examination this year?

Nineteen of the fifty-five questions were on the subject of touchdown autorotations. That indicates what an accident maker this maneuver is.

The Weekly Summary also preaches to us about loss of combat effectiveness through damaged equipment and conservation of our resources through proper use and safe procedures. These are good points, yet we continue to practice a maneuver which is one of the biggest contributors to the accident rate. Any survey of aircraft accidents reveals the not too startling fact that most accidents occur in close proximity to the ground. This is just a $10 way of saying that as long as you stay away from Mother Earth your chances of "pranging" your bird are drastically reduced. Why then take several tons of metal, with you inside, let it fall powerless at approximately 1500 feet a minute and depend on split-second timing at the last moment to get you safely on the ground and avoid an accident? Just as much good can be accomplished by making a power-recovery at the bottom and you don't expose yourself and your machine to injury and damage.

Let's examine a few theories of mine - and many others. Most rotary wing pilots practice countless touchdown autorotations during their careers and are never faced with the real thing. How many actual autorotations have you performed where you had sudden, complete loss of power and had to make a touchdown with no power to assist you? I believe that most pilots would have to answer, "None." Of those who answered affirmatively, how many of you successfully completed the emergency landing without damaging the aircraft? Many more fell by the wayside, I believe. I conjecture that the reason for the damage was not faulty technique but unfavorable terrain. Unfortunately, when the actual failure happens, it does not occur over a hard-surfaced runway in a controlled environment, but often where trees, rocks, depressions, gullies, etc., take their toll and the most beautifully executed maneuver ends with the sick sound of protesting metal. So all that valuable training was for nothing anyway. What is important is being able to reach a suitable landing area, reasonably into the wind, controlling the aircraft to the point where you have RPM, reduced airspeed, and are in a level attitude. After that, the training you had, and selfpreservation will make you pull pitch.

When a student attends flight school, he flies with instructors who perform touchdown autorotations almost daily and they become experts at it. I know; I instructed at Fort Rucker for two years. Most students under the guidance of the IP become proficient also. When they go into the field they usually perform touchdown autorotations only during standardization rides or when checking out in a new aircraft. Over a period of time their proficiency decreases. Many times the IP with whom they are riding has lost or never really developed his proficiency, often through no fault of his own. Here we have an accident waiting to happen. It is only a matter of time and circumstances and it is all so unnecessary.

What can we do? Well, if we seriously want to reduce the accident rate, here is a prime area for honest examination. The sound of grinding metal, bruised pride or bodies and another aircraft out of commission are just not worth it. I say we should discontinue touchdown autorotations in the field in favor of power recoveries. This alone would save many dollars each year in repairing damaged aircraft, provide many more aircraft in commission, and make a significant reduction in the accident rate. Enough training can be accomplished by initiating the maneuver, reaching the area, and recovering with power at an altitude low enough to make it realistic. Fun maneuvers have no place in Army aviation unless they serve a useful purpose. Are practice touchdown autorotations really necessary?

* * * * *

THE CARE AND FEEDING OF NOMEX FLIGHT GEAR

System Safety Branch (IGFS)
HQ AFSC, Aerospace Safety Division

Coverall, Type CWU-27/P: This coverall fabric is a drip-dry type requiring no special handling and may be washed as frequently as needed. The coverall may be laundered at home or in a commercial-type washer and dryer. Laundering in water up to 140°F maximum and tumble drying up to 180°F will not damage or shrink the overall. Since the coverall fabric is a high-temperature resistant material, ironing or pressing will not remove the wrinkles and creases. It is recommended that immediately after tumble drying or during drip drying, the coverall be hung on a hanger. Laundering will not compromise the flame retardant properties of the "NOMEX" and no renewable flame retardant treatment is required. (NOTE: It is recommended that a new coverall be laundered prior to use in order to soften the fabric and eliminate any possible skin irritation that might occur due to original fabric harshness.)

Flight Gloves: The leather portion of the glove is a launderable type and the fabric portion is a drip-dry type. The gloves may be laundered with warm water and mild soap by one of the following methods: (1) Don the gloves and wash with soap and water in a similar manner as washing the hands. When gloves appear clean, rinse, and remove from hands. Squeeze, but do not wring or twist gloves to remove excess water. After removing excess water, place individual glove flat on a towel, roll towel to cover glove making sure that the gloves do not come in contact with each other. (2) The gloves may also be laundered at home or in a commercial-type washer and dryer. Laundering in water up to 140°F maximum and tumble drying up to 180°F will not damage or shrink the glove. (NOTE: Do not use any type of bleaching compound in laundering. To avoid excess wear on the gloves during washing and drying, make sure there are sufficient articles in the wash to absorb tumbling shock.)

"HOMEITUS"

CAPTAIN RALPH D. MCRAE, JR.
Lexington-Blue Grass Army Depot

All pilots have experienced "homeitus" at one time or another. I would define "homeitus" as the feeling that one must return to his home base immediately when his better judgment tells him otherwise. Pilots are frequently known to perform unsafe acts while trying to get home that they wouldn't think of doing during any other flight. The following describes how an extreme case of "homeitus" caused an otherwise capable pilot to disregard all common sense in order to save a few minutes returning home.

In the Republic of Vietnam, it is common practice for 0-1's to operate from small uncontrolled airfields that also serve as staging areas for helicopters. Due to the limited parking areas at some of the smaller airfields, the parked helicopters make it physically impossible for fixed wing aircraft to land or take off when the helicopter blades are turning.

One day during the latter part of 1969, a transient 0-1 landed at a small airfield after completing a mission nearby. While the 0-1 was being refueled, a flight of ten UH-1's landed in trail along side the runway. Two of the huey's in the middle of the formation were still turning when the 0-1 was ready to depart. Two US Air Force 0-1 pilots cautioned the transient about departing while the huey blades were turning. The transient had already completed his mission so there was no reason for his haste other than his desire to get home.

After looking things over and hearing the words of caution, this pilot decided to take off immediately in spite of the helicopters turning up near the runway. During his take-off roll, the rotor wash from the first helicopter started to lift his right wing. As he passed the second helicopter, the Birddog veered right and twelve inches of the right wing were severed by the rotor blades of the huey. With more than enough runway remaining to abort the take-off, the pilot continued and promptly departed for his destination over some of the most VC infested areas in the IV CTZ.

I witnessed this incident from overhead, where I had been circling in another 0-1, waiting for the hueys to either depart or secure their rotors. When it became obvious that the transient did not intend to return to check the damage, I called him on the emergency frequency and told him that part of his wing was back on the runway just in case he didn't know it.

This pilot was extremely lucky to have escaped injury during the accident but to continue the flight without so much as checking the damage was pushing luck much too far.

This extreme example of "homeitus" could have caused injury or death in addition to the many hours of maintenance required to repair the aircraft.

All pilots should take an extra close look at any proposed flight home in order to eliminate any "homeitus" that might have influenced the first decision. One more night or a few more minutes away from home is surely better than never getting there at all.

* * * * * * * * * * * *

HOT WEATHER HAZARDS

Aviation Section, MICOM

Do You Have Enough Runway?

During the summer months one of the hazards that is overlooked most often is Density Altitude. Pilots flying from a cool, low airfield in the east to a hot, high airfield in the west or midwest don't seem to understand the loss in power output of their engines, the loss in carrying capacity, or the extra runway use on both take-off and landing. Pilots seem to think that because they were able to carry a specific load one time, they will be able to carry this load any time, any place.

Some Facts about Density Altitude

High Density Altitude (D.A.) can cause as much as a 300% increase in runway used for take-off. High D.A. can cause 10 to 15% increase in true air speed on landing, even though your glide angle is the same.

High D.A. will also cause a marked increase in runway used for roll out.

How to Find Density Altitude

The easy way is with your E6B Computer. Take the pressure altitude obtained by setting 29.92 on your altimeter, allow for K Factor. The altitude read from your altimeter is pressure altitude. Now on your E6B, set air temperature opposite pressure altitude and read density altitude opposite the arrow; then use it for decisions on your loads and capabilities.

DO YOU HAVE AN ALTERNATE?

CPT Bruce A. Lindsay
MUCOM

Any Army aviator currently instrument qualified can certainly quote the various destination and alternate minimums pertaining to filing IFR flight plans. For an example, and an always needed review, we all know that we must file an alternate airfield if our destination is forecasting a ceiling of less than 3,000 feet above the appropriate landing minimum and/or visibility of less than three miles or one mile more than the appropriate landing minimum, whichever is greater, during the period one hour before to one hour after ETA.

And, with an occasional reference to AR 95-2, we can recite the weather requirements for listing an airfield as an alternate, whether the airfield has an approach published in FLIP, another published approach, or no instrument approach at all.

Attention to these requirements generally becomes routine to the point that completing the flight plan involves checking the most up-to-date forecasts, determining whether an alternate is required, and on the basis of available weather information, making a suitable choice.

But lest this become too much of a review of the rules, let's discuss a situation which is not so routine a matter - in fact, one to which most aviators probably don't give much thought. At what point during an IFR flight does an alternate airfield cease to be such? Sounds rather cut and dried doesn't it? But just how much thought have you put into the subject?

Let's start our discussion with the most obvious example: An airfield ceases to be an alternate when it becomes the destination - that is to say, the weather at the original destination goes below appropriate minima. This condition may become evident from weather reports received before reaching the destination or upon executing a missed approach due to weather. No matter when the condition is determined, this is the point when clearance is requested to either hold, if the weather shows signs of improving and the alternate minima can be maintained, or to continue to the alternate.

Secondly, your selected alternate may go below appropriate approach minima - now you no longer have an alternate as such. This situation is not serious in itself, if your destination weather holds up. But what about a combination of the two situations - what happens if unforecast weather moves in and puts both destination and alternate below minima -

what courses of action do you now have available? Add the possibility of lost communications and you have a whole new story. The probability of all three happening at once is low; the probability of the first two occurring is also low, but may be increased depending on the area into which you are flying.

We're not trying to imagine all kinds of improbable situations, but we are trying to make a point: Maybe the listing of an alternate on that flight plan shouldn't be as routine as it seems. Maybe more thought could be put into the possibility that your alternate can become something else. Maybe it would be wise to ask a few more questions at the weather briefing, such as, "If I need it, what direction is the best way to find better weather?". That's what the "Comments/ Remarks" section is for.

We've thought up two instances when "no" is the answer to the question posed in the title. How many can you think of?

* * * * *

HOW TO RELAX

The National Institute of Mental Health has these suggestions:

1. Release your worries by talking them over with a trusted and non-critical friend, clergyman or family doctor.

2. Plan time for physical recreation or a hobby. Work off your anger. Time devoted to a relaxing hobby will take your mind off your worries.

3. Make minor escapes. Go to a show, read a book or magazine. Television can be an excellent tranquilizer. A week-end trip provides change of scenery.

4. Tackle things one at a time. Meet individual problems day by day and you'll find the insurmountable will have been conquered.

5. Take your mind off yourself. Do something for someone else. This will help release your "emotional strain." It also gives the satisfaction that comes with doing for others. This, however, does not mean subservience to the wishes of the others at the expense of your own needs and desires.

6. Set realistic goals. It isn't necessary to shoulder the world's problems by yourself. Don't expect perfection in all that you attempt. Lifting a too heavy object can strain us physically. Worrying about

unbearable tasks can strain us emotionally. Make a fair appraisal of your abilities and then set your goals accordingly.

7. Resolve your own problems. Whenever practicable, use your own abilities and judgment to solve your problems. Most people have the ability to handle day-to-day crises by themselves.

8. Master your frustrations. Learn to accept them, forget them and move on to new challenges. Don't take yourself too seriously.

* * * * *

FEDERAL REGULATIONS REGARDING TIRES

Federal regulations now require that the following information be molded into the side of all new tires: size designation, maximum permissible inflation pressure, maximum load rating, identification of manufacturer by either brand name or approved code mark, composition of material in the ply cords, actual number of ply cords in the sidewall and the number of ply cords in the tread area if different from the sidewall, the word tubeless or tube type where applicable, and the word radial if the tire has radial ply cords.

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ABOUT RADIAL TIRES

A driver lost his life in a motor vehicle accident, and investigation revealed that the car was equipped with a radial tire on the right front wheel, and with conventional tires on the remaining three wheels. This condition was considered a significant accident cause factor. It was suspected that the radial tire held a true track, while the conventional tires lost traction and caused the skid that resulted in a head-on collision.

The mixing of radial and conventional tires is a safety hazard! Preferably, radial tires should be installed on all four wheels. However, if only two radial tires are installed, they should always be used on the rear wheels. Radials should never be installed on front wheels with conventional tires on the rear.

The basic design of radial tires is such that when you turn the steering wheel, they immediately take up the new tire heading without the normal side deflection of conventional tires. This would produce a skid in the case of conventional tires on the rear and radial tires on the front. The use of only one radial tire on the front is highly dangerous, even under ideal road conditions.

- SAC Safety Bulletin

THE SAFETY MANAGEMENT PROBLEM

R. Hendershot, Safety Officer
U. S. Army Munitions Command

Present attempts to control accidents and their consequences can best be described as trial and error. Adequate measures of the effectiveness of the control of accidents do not exist in practice. The degree to which accident control is possible is a function of the adequacy of the overall accident prevention effort and not the magnitude of injuries which have occurred. Most current safety efforts are based upon after-the-fact appraisals of accident statistics involving injuries and causal relationships. The majority of the safety managers' efforts are concentrated on after-the-fact solving of problems in lieu of looking ahead and providing solutions before problems arise. At present, we do not know the effect of any combination of prevention efforts on the system we are concerned with controlling. Actually, we are unable to measure safety effectiveness with our present techniques. We would like to be able to appraise the effectiveness of accident prevention efforts by directly measuring their influence on an acceptable criterion of safety performance as it fluctuates over a period of time.

Basically, most of our techniques for investigating causal or preventive aspects of accidents are based on post-mortem inquiry and retrospective analysis. In general, conventional modes for evaluating the degree of hazard or level of safety performance associated with a given behavioral situation or physical environment are based on measuring and comparing the number or frequency of accidental occurrences. Such comparisons are mere statistics and difficult to interpret into meaningful terms; first, because of the statistical "flukiness" which governs the occurrence of rare events; next, because each occurrence is usually different in its nature and consequences; and finally, because the expected frequency of occurrence is the product of the risk or probability of occurrence and the magnitude of human exposure.

At present we use two approaches to determine the level of installation safety. The first approach involves the use of available historical data; e.g., accident costs, accident frequency rates, severity rates, etc. The other approach involves indirect indices based on the occurrence or possible occurrence of events which are believed to be related to accident causation. This latter approach places emphasis on methodology for determining existing hazards and weighing the criticality of such hazards through on-site inspections or surveys.

New measures are needed which will enhance our ability to predict and control accident losses. The best we can achieve is a combination of

instruments which will add new dimensions to our ability to identify, evaluate and eliminate both existing and future potential accident problems.

Fundamentally, there are two facets which need control: the environmental and human behavioral factors. During the past three decades, serious concern has sporadically been directed toward the control of the working environment. However, in the absence of practically any understanding that the complex safety problems cannot be solved by simple approaches and because the exciting events demand quick attention, hasty antidotes usually are proposed. But when time has pushed the initiating event into the past, the improbability of an immediate recurrence encourages acceptance of the expediency as "good enough." Sometimes the event will be disregarded since the same thing has been done for many years with no significant problem occurrence and an event now is considered acceptable.

Some observers, notably Heinrich (Industrial Accident Prevention, 1931), judged as significant, small events which by the grace of good fortune were not severe, but could have been. Among the safety fraternity there has grown a great concern for tabulating and evaluating minor injury and no-injury cases with the intent of uncovering correctable causal factors and thereby shutting off the occurrence of more serious cases. This objective has proved to be more hopeful than realistic. Considerable effort and some success has been achieved with minor injury cases but little or no success with the no-injury cases.

What all this means is that the field of accident control -- safety management -- has found itself constantly beleaguered by the difficulty of measuring, comparing, interpreting, evaluating and, hence, controlling the physical and human situation of interest. In essence, it is virtually impossible to apply standard safety measurement codes, as we know them, and to attain reliable estimates of safety effectiveness. It is sufficient to point out that the present standards (measures) are neither stable nor sensitive to changes in system inputs and have dubious reliability of overall safety effectiveness.

There are a number of modes for reducing accident potential such as:

1. Eliminating or reducing hazards.

2. Eliminating error -- by automating functions.

3. Human engineering equipment, tools, instructions, procedures, the work environment or the organizational structure.

4. Improving the monitoring of operations to eliminate errors or their consequences.

5. Improving feedback concerning errors and their consequences.

Intuitively, safety decisions for the physical climate should be based on four judgment factors:

1. The likelihood (probability) of occurrence of an unwanted consequence.

2. The identification of error in likely or hazardous operations is the first step in selective automation. Even if full automation of operations is not feasible, it may be possible to reduce the complexity of error-producing behaviors by machine-aiding of worker performance. Hazardous operations can be controlled by remoting the operations in some instances or reduction of error potential by automation or machine interlock. Complete automation of all operations is highly unlikely; consequently, the application of automation techniques for purposes of increased safety must usually be highly selective.

3. Review of all waivers, exemptions and authorizations to assure that all are considered for elimination. Modernization plans must provide that all explosives quantity-distance relationships are maintained from the modernized facilities to existing facilities and vice versa. Production support programs should give high priority to the elimination of existing hazards or those created by the change of a facility or line for a different product. Finally, improvement plans must provide for the elimination of all waivers and exemptions and safety authorizations.

4. The final tool to be discussed for the physical climate is the system safety effort applied to existing or new operations. Safety personnel must become involved with both management and the production engineers' plans as near to inception as possible. This can be achieved by maintaining close rapport with managers and engineering personnel. The system safety coordination should involve as a minimum:

a. Conceptual production plans.

b. Review of procurement-production package.

c. Discussion of production development problems with the commodity center safety staffs.

d. Preliminary production planning.

e. Line layout.

f. Training plans.

g. Operating procedures.

h. Job safety breakdown.

i. Pre-operational surveys.

j. Monitorship of operations to eliminate errors of their consequences.

k. Improving feedback concerning errors and their consequences.

The behavioral (human) climate deals with such things as the amount and effectiveness of training, recognition, stimulation of individual alertness, freedom for individual growth and contribution through participation involving more than paid physical effort. In 1968, there were two surveys conducted of behavioral compromises of safety: one by the American Institutes for Research and the other by Fry Consultants, Inc.

The behavioral surveys indicated that human behavior, as a central aspect of the system, helps determine the prevailing climate and attitudes, which in turn condition behavioral outputs of the system. This framework emphasizes the importance of accident behavior analysis as contrasted with our traditional injury analysis to understand the cause of accidents. It also emphasizes the importance of monitoring and adjusting relevant system conditions to prevent accidents.

Generally speaking, the employee views and accepts his role as one of performing his work in the prescribed manner and under prescribed direction because he is paid to do so. However, this mode of adjustment limits participation, learning, involvement and awareness which are vital in accident prevention. One of the most significant behavioral compromises is taking a "short cut." The aforementioned studies revealed that there is no single answer as to why this is being done. It is usually a matter of various combinations of characteristics of the worker, the supervisor, upper management and the general environment in which it occurs. What this means in terms of remedial actions is that there is no single solution and that no single segment of the total work force can be expected to effect a total solution. Safety is an integral part of day-to-day operations and management, and it must be treated by everyone as such, if all facets are to be covered.

Proposed actions to increase employee safety awareness and motivation to work safely by improving key aspects of the behavioral climate are:

1. Employee motivation and participation -- People identify with things and people most closely associated with them; therefore, it is important that motivational techniques have personal appeal. Immediate steps were urged to promote greater employee involvement in safety

meetings, the suggestion program, safety awards and inspections. Awards to individual work units based upon safety records is desirable. Active participation by workers is important. Further use of the personal approach would be very beneficial, particularly, recognition by top management.

2. Training -- There has been substantial evidence that employees are not being properly trained for the job(s) they will have to do. A performance-oriented training capability is needed. For production employees, training should be provided by means of actual or simulated equipment, affording opportunity to exercise knowledge during the development of habit and skills. This approach will enable the employee to combine safety, quality and quantity through initial learning of correct performance. Application of knowledge during performance is required to assure effective retention and awareness. An adequate audit trail needs to be devised to assure retention of this quality performance on the job. In addition to the employees, supervisors must be trained for their jobs. However well trained on the job the foreman may be, his ability to teach has been largely ignored, yet he is relied upon, in many instances, to train the new employee. The person responsible for training must know how to teach.

Finally, safety personnel must participate in all phases of the overall training program as it may affect the safety of the installation.

Editor's Note: This article is representative of the varying philosophies regarding safety management. It should not be construed as policy or the accepted norm, but should be interpreted as "one man's opinion.")

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JOLIET ARMY AMMUNITION PLANT VEHICLE OPERATIONS BRANCH RECEIVES SAFETY AWARDS

Fourteen employees of the Joliet Army Ammunition Plant Vehicle Operations Branch have been presented with National Safety Council Safe Driver Awards. Their safe operation of vehicles resulted in the Branch's accumulation of 22,481,586 miles of injury-free experience. In addition, the Branch was presented with a U. S. Army Certificate of Merit for Safety in recognition of 20 years of operation without a lost-time injury. This remarkable safety accomplishment is a credit to all personnel of the JAAP Vehicle Operations Branch.

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WAYWARD WRENCH DAMAGES PROPELLANT MIXER

Serious equipment damage occurred during a mixing operation at a propellant manufacturing plant when a 15/16-inch open-end wrench inadvertently found its way into a propellant mixer. The mixer bowl and blades were scored, eight teeth of the intermediate drive gear were sheared and the main drive belt was disengaged at the main drive motor. Damage to the equipment exceeded $2,200.

At the time of the incident, M1 single-perforated propellant (105mm) was being processed in the mixer. As the initial investigation of the bound mixer began, a concurrent investigation was being performed in the nitrocellulose area where foreign material was suspected in a final wringer. A wringer operator had found and secured a wrench that was about to fall through the final wringer into a "nitrocotton" tub below.

It was concluded that two wrenches had been left on the wringer drive motor base by an area maintenance employee on the previous day. One wrench fell through the final wringer into the tub below, was then processed through a dehy press and charged into the mixer without being detected.

The area mechanic was given a written reprimand for his negligence while performing maintenance activities. Maintenance and production supervisors were reinstructed to emphasize the importance of keeping foreign objects out of process material. The incident was discussed in detail at all maintenance and production safety meetings.

RECOILING BREECH STRIKES GUNNER

An EM assigned to an artillery test activity was loading a round into the breech of an M56 Self-Propelled Antitank Gun. Post-firing recoil fractured the gunner's collarbone.

The breech of subject weapon closes automatically when a round is loaded. It was determined that the firing linkage did not fully return to its proper position. Instead, the firing linkage forced the plunger trigger to extend approximately one-eighth inch into the breech, the closure of which contacted the trigger and fired the weapon.

Prior to firing, maintenance checks were performed on the weapon in accordance with TM 9-2350-213-10, and no deficiencies were noted. When the weapon fired prematurely, the injured individual's arm was positioned in the proper loading manner. The breech recoiled approximately 54 inches, striking the EM on the shoulder.

Similar accidents will be precluded, hopefully, by the performance of more stringent operational and maintenance inspections on these weapons.

FALLING TREE FELLS CUTTERS

Two work crews were clearing a wooded area on the installation. One crew was felling a tree approximately 75 feet high. The tree did not fall in the intended direction of north, but rather to the northwest. As it fell, it struck other standing trees and ricocheted further to the left. The tree fell to rest in the vicinity of the second work crew approximately 50 feet away, striking two workers. Both employees suffered disabling lacerations about the head.

The accident was discussed at all safety meetings with emphasis placed on wearing of personal protective clothing and equipment (crew members were not wearing hard hats). To preclude the occurrence of similar accidents, more supervision of tree felling operations will be required. Also, work crews engaged in this type of operation will not be permitted to work in the same general area.

DROPPED PLATE SMASHES TOE

A civilian maintenance employee was sliding a piece of aluminum plate on the floor from a milling machine to a forklift. Subject plate weighed approximately 17 pounds and measured 8" X 22" X 1". During this movement, the worker dropped the plate onto his right foot. He suffered a toe fracture.

The injured employee had been issued safety shoes prior to the accident; however, he had complained that the shoes were uncomfortable and was instructed to visit a foot specialist for a prescription for special shoes. The worker failed to do so and was not wearing safety shoes when the injury occurred.

The worker's failure to wear prescribed personal protective equipment and disregard of instructions allowed the injury. To prevent recurrence, all shop personnel have been instructed to wear required safety apparel when on duty at the work site.

THE FEAT OF CRUSHING FEET

A post exchange employee was working under the hood of a vehicle. He was attempting to start the stalled engine for the unknown female driver. After starting was achieved, the driver, for reasons unknown, moved the vehicle forward striking the attendant and knocking him to the pavement. The driver stopped momentarily, but left the scene after the injured had crawled from the path of the car. The attendant suffered a fracture of the left foot.

After the Military Police have located the driver, the investigation of the accident will be completed and corrective action will be taken.

At another installation, a production worker was walking from one operating building to another. Without either seeing the other, the driver of a commercial tractor backed his vehicle over the right foot of the pedestrian. The driver stopped the tractor when he felt the "bump" as the right rear outer wheel passed over the employee's foot. The worker suffered multiple fractures and dislocation of the right foot.

Both driver and pedestrian were inattentive. The pedestrian exposed himself to the right-of-way of a backing tractor, while the driver failed to exercise normal backing precautions. To reduce the potential for similar accidents, the installation has eliminated all parking in the vicinity of the accident scene, and has rerouted tractor traffic in such a manner that attaching to trailers can be accomplished with minimal backing.

PESTICIDE ACCIDENT

Pesticides Office
Environmental Protection Agency
Washington, D. C. 20250

The misuse of Thallium Sulfate for rodent control resulted in the death of a seven-year old boy and illness of his three-year old sister.

An investigation revealed that in July 1970, the children's uncle, with whom they lived, had contracted with a local exterminating company to treat their home monthly for rodents. The method of treatment consisted of impregnating various kinds of cookies with a 99.5% Thallium Sulfate powder and then placing these baits behind large appliances in the home.

In October 1970, the seven-year old boy began complaining of leg pains and was soon hospitalized. At the time of his admission, the cause of illness was not readily apparent. When the boy's uncle and mother were questioned about possible poisons in the home, neither could recall that any had been used. However, several days later, the uncle remembered his arrangement with the exterminating company. After notifying the hospital, the uncle found a remaining treated cookie and wrapped it in aluminum foil. He placed it on the kitchen table with the intention of bringing it to the hospital for analysis. At this point, the boy's three-year old sister found the cookie and ate part of it. When this was discovered, she was rushed to the hospital and admitted. An analysis of the bait cookie revealed high levels of Thallium Sulfate.

Intensive efforts to save the boy proved futile. He remained hospitalized in a coma until his death in late December 1970. The little girl was released, apparently fully recovered.

In 1965, the Federal Government under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act placed severe restrictions upon the household use of Thallium Sulfate pesticides. Most states have similar restrictions. The household application is restricted to use only by the Federal, State or local government personnel who have been trained to use it.

Thallium Sulfate may cause serious brain damage when consumed in relatively small amounts. Such products should not be available in retail stores and never used or stored where children or pets have even remote access to them.

CARRYING A BOMB IN YOUR CAR

A New Cumberland Army Depot employee's car was damaged when a pressurized can of windshield deicer exploded in the glove compartment. The force of the explosion blew out both ends of the glove compartment. This explosion occurred on a warm spring day when the outside temperature was approximately 80°F.

Many people have been killed or injured through careless use and handling of pressurized containers. Serious accidents have occurred when pressurized containers have been thrown into trash fires. Handle all pressurized containers with care and caution.

Note deicer container fragments and pieces of glove compartment sidewalls.

Holes in compartment sidewalls are shown in this picture.

Don't carry a bomb in your car!

ELECTROCUTION
HIGH-VOLTAGE LASER TRIGGER CIRCUIT *
*(NON-AEC)

An electrocution occurred during routine maintenance of a high-voltage trigger circuit for a LASER. The victim had been working in a laboratory area testing a LASER oscillator/amplifier system. After starting the tests, the employee found that the amplifier flashlamps would not trigger and decided that the cause of this malfunction was due to a defective klystron tube. He therefore shut off the power, removed the covering over the rectifiers and resistors, set these aside, and then took the top off the power supply. After unlocking the door of the power supply, he cut the high-voltage transformer lead so that he could reach the krytron tube circuit components. The high-voltage transformer was then disconnected and removed, and the defective tube replaced. Following assembly of the system, the power was turned on and another attempt made to trigger the flashlamps. The flashlamps failed to trigger. With the power on, the employee reached into the power supply and was electrocuted.

Upon hearing the victim moan, an engineer working in the same laboratory turned around and saw him fall to the floor. The engineer immediately turned off the power and called for assistance while administering heart massage to the victim. An ambulance arrived in approximately seven minutes and police took over the heart massage. Oxygen was administered continuously with the heart massage throughout the trip to the hospital, where the victim was pronounced dead by the attending physician.

Subsequent investigation was made of the system involved in the incident and it was found that the high-voltage wire, which had been cut prior to replacing the tube, had not been repaired before reassembling the system. It was apparent that the employee had forgotten this one vital step before turning on power to the system, and this error in memory resulted in his death.

This electrocution accident demonstrates the fact that when working with LASERS, the beam is only one of several hazards which must be considered if LASERS are to be operated safely.

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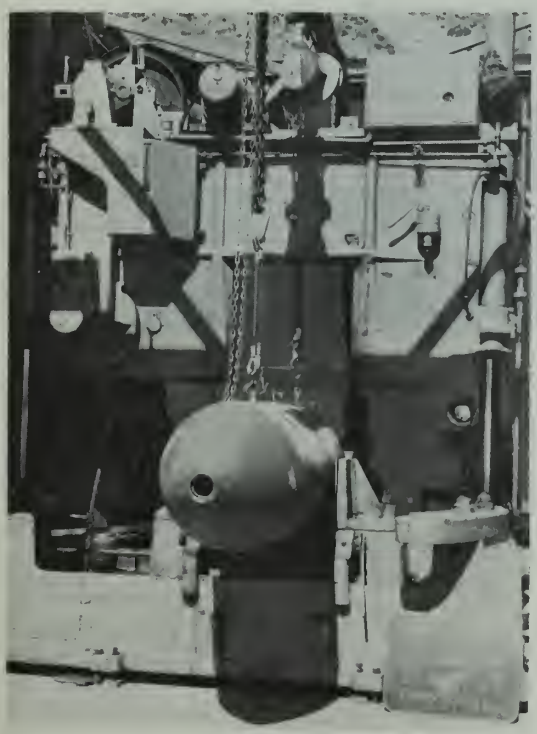
*Editor's Note: A description of this incident was supplied to AEC by Mr. C. C. Callihan, President of Spacerays, Inc., Burlington, Massachusetts. The incident also appeared in the April 1971 issue of LASER FOCUS.

- Serious Accidents, Issue #316
U. S. Atomic Energy Commission
Washington, D. C. 20545

MUNITIONS SECTIONALIZATION

Based on the necessity for development of munitions sectionalization criteria, the Ammunition Equipment Office, Tooele Army Depot, received project assignment from Picatinny Arsenal to conduct a series of impact and drop tests of general purpose bombs.

Equipment was designed and developed to safely sectionalize live bombs. Considering all standard precautions associated with the machining of cased explosives, the operation was laid out to afford maximum protection to personnel. The saw apparatus was inclosed within 30-inch reinforced concrete walls. A bunker, protected by two earthen barricades, provided remote control for the operation which was monitored by closed-circuit television.



Photo, left, shows the sawing equipment with a bomb rigged into position. Photo, right, shows bomb sections.

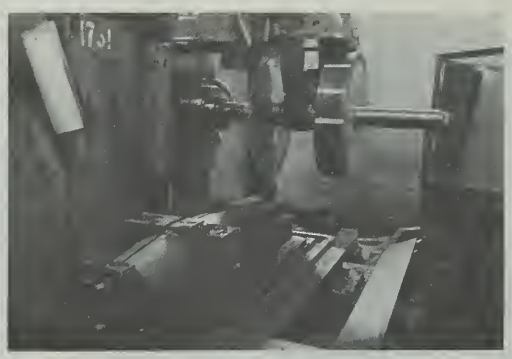
The saw was fabricated in such a manner that critical ignition temperatures would not be reached, thus negating the use of a coolant. It was felt that the use of a coolant might have an adverse effect on the explosive filler in regard to chemical analyses that were to be performed on the same.

The efficiency and overall safety of the bomb sectionalization method gave rise to its application elsewhere. Munitions loading plants have been able to achieve new levels of confidence in their quality assurance programs through acceptance of the sectionalization technique as a means for visual inspection of explosive filler and inert sealing pads.

For example, Ravenna Army Ammunition Plant is sawing 175mm M437, Composition B-loaded projectiles, selected at random, to allow for close visual inspection of the explosive cast for possible separation from the base of the projectile.

In the Ravenna sectionalization operation, the projectile, following cyclic heating, is transported to the Sectionalizing Area where it is positioned on the saw feed table. Operating personnel then retire to a barricaded control building for observation of the process on closed-circuit television. Initially, a hotizontal cut is made through the boat-tail portion, one-half inch below the bottom of the cavity. Following manual repositioning of the projectile, a longitudinal cut is made through the projectile and explosive cast.

Photo, right, shows the saw blade in the raised position. Note the halved projectile within the hold-down jig.



Automatic and manual controls are employed in the process. Two jets of coolant are directed onto each side of the saw blade into the cutting area. Actuation of the saw, coolant flow and observation of the operation takes place in the barricaded control building. If coolant flow should stop, an audible warning is sounded and the saw blade rises from the cut and stops, as does the feed table mechanism when the saw is cleared.

The lineal and rotational speeds of both the power hacksaw blade used in bomb sectionalization and the circular saw blade utilized in projectile cutting are in compliance with requirements listed in paragraph 26-15f, AMCR 385-100.

The photo at left shows the saw blade in the raised position following cutting. Note the halved projectile.

The M117A1 General Purpose Bomb tests, conducted on bombs, indeed proved to be worthwhile. In addition to providing data which gave eventual resolution to the problem at hand, the tests gave credibility to potential usage of the sectionalization techniques at the manufacturing level. Such "spinoff" has enhanced the safety and cost effectiveness of Army materiel.

Editor's Note: Information used in this article was extracted from data provided by the Ammunition Equipment Office, Tooele Army Depot, and the Ravenna Arsenal, Inc. Safety Department, Ravenna Army Ammunition Plant.

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A USEFUL IDEA

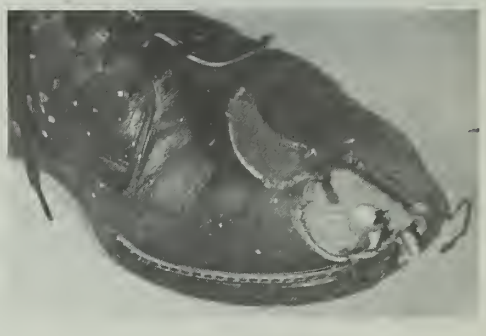
Ned Seymour, a Group Leader in the Tractor Shop at Badger Army Ammunition Plant, had given frequent thought to hazards presented by moving fans, belts and pulleys on all types of equipment and vehicles. The hazard potential has run rather high with most of these components being black in color from the manufacturers.

Mr. Seymour found that by painting one fan blade white and that by painting a spot of white on the fan belt, a brilliant flickering effect resulted while the engine was running.

POWER MOWERS STRIKE AGAIN

Although lawn mowers are being put away until spring in most sections of the country, the need for emphasizing power mower safety, indeed, has no seasonal restrictions. The shoe pictured below is that of a Pueblo Army Depot supervisor. A few days before the accident, he conducted a safety meeting for his employees. The topic discussed was, ironically, power mower safety.

A few days later, the employee was mowing his lawn. As he attempted to guide the mower through a heavy growth of grass, the power began to falter. He attempted to help the mower along by pushing it with his foot.



The result, as one can see, was that the toe of his shoe was struck by the whirling blade.

His toes, however, were spared from injury because he was wearing safety shoes.

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REFERENCE PUBLICATIONS

AR 55-55 12 Nov 70	Transportation and Travel - Transportation of Radioactive and Fissile Materials Other Than Weapons
TB 750-237 12 Feb 70	Maintenance of Supplies and Equipment - Identification of Radioactive Items in the Army Supply System
TM 55-315 14 Jan 71	Transportability Guidance for Safe Transport of Radioactive Materials
USAMC SUPPL 1 to AR 55-355 23 Apr 71	Military Traffic Management Regulation
DA Pam 385-5 May 71	Fundamentals of Safety in Army Sports and Recreation
DA Circular 351-27 27 May 71	Schools - Army Aviation Safety Course

PLANNED PROGRAMING PAYS OFF

The January 1971 issue of the AMC Safety Digest briefly summarized the 1970 Vacation Safety Promotion Program conducted by Hercules, Incorporated, Radford Army Ammunition Plant. Also, a specific Motor Vehicle Safety Campaign (off-post) was described in an earlier issue. These two efforts, combined with the National Safety Council Defensive Driving Course, played a major role in reducing motor vehicle accidents on and off the installation.

In addition to the three programs mentioned above, established promotional and motivational approaches were utilized including plant newspaper articles, sign board slogans, monthly emphasis in supervisory safety newsletters, and "piped" music, well-mixed with safe driving commentary.

A summary comparison of the results indicate high effectivity of the total program:

1. On-the-job vehicle accidents decreased from 49 in 1969 to 19 in 1970.

2. On-the-job motor vehicle frequency rate dropped to .42 from .81 per 1,000,000 miles driven.

3. Over $1,500 was considered saved in vehicle damage costs.

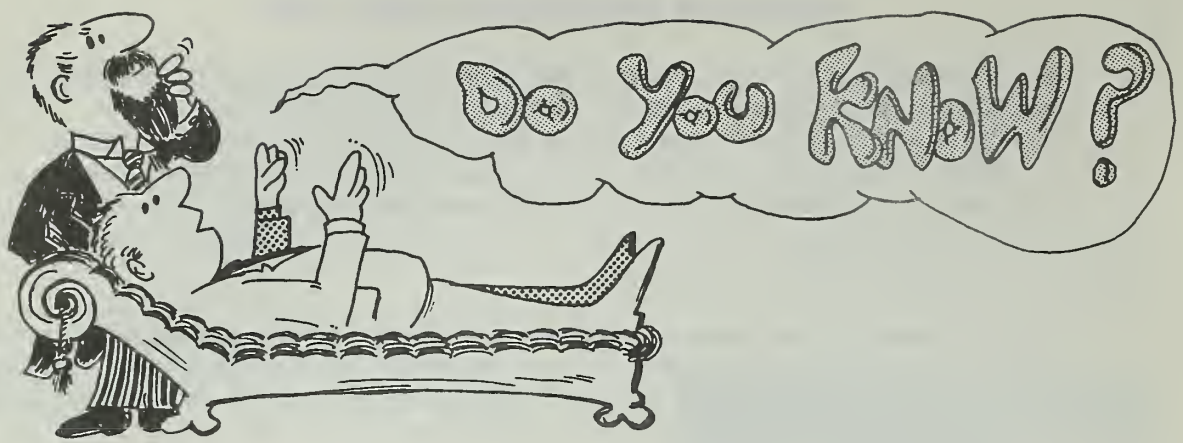
4. Off-the-job vehicle accidents decreased from 244 in 1969 to 86 in 1970.

5. Off-the-job transportation accident frequency (estimated) dropped to 4.66 in 1970 from 8.35 in 1969.

6. Off-the-job fatalities as a result of vehicle accidents declined from ten in 1969 to zero in 1970.

7. Over $70,000 in combined individual and plant costs were saved in 1970 as compared to the previous year for off-the-job vehicle accidents.

With planned programing aimed toward responsible driving at all times, the Hercules Safety Department can be proud of the tangible results achieved in the extremely difficult area of traffic safety.



Here are ten questions that will test your knowledge of safety requirements that you will need under different circumstances. Answers to these questions may be found in the AMCR 385 series and the AMC Supplements to the AR 385 series. How many can you answer without referring to the regulations?

1. What is the maximum surface temperature permissible for lighting fixtures in explosives dust atmospheres when the ambient temperature is 80.6°F. (27°C.)?

   Answer and reference:

2. What temperature must be afforded to protect wet-pipe sprinkler systems from freezing?

   Answer and reference:

3. Explosives limits for an operating building should be set at the maximum allowable by applicable quantity-distance tables. True or False?

   Answer and reference:

4. How often should fire exit drills be held with due consideration given the size of the building and the number of occupants?

   Answer and reference:

5. If the Commanding Officer of an AMC installation does not have the Safety Director as a member of his staff, what must he do?

   Answer and reference:

6. What term is used to define a temporary failure or delay in the action of a primer, igniter or propellant charge?

   Answer and reference:

7. What temperature is not to be exceeded in explosives melting operations?

   Answer and reference:

8. When and to whom are applications to be submitted by AMC Government-owned, Government-operated installations, eligible for National Safety Council no-injury record awards?

   Answer and reference:

9. Is local procurement of safety promotional material authorized?

   Answer and reference:

10. What specific requirements must be met prior to using trestle ladders for temporary scaffolding?

    Answer and reference:

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FIRST AID MEASURES FOR CHOKING VICTIMS

The Red Cross recommends the following first aid actions be taken in case of a choking accident:

1. If the person is breathing adequately, despite choking and coughing, it is best not to interfere with his efforts or to strike him on the back.

2. If efforts at expulsion stop and the victim is unable to breathe, he should be placed on his side (a child should be inverted on the rescuer's forearm with the head down), and firm blows should be delivered over the spine between the shoulder blades.

3. Mouth-to-mouth artificial respiration should be initiated promptly in an attempt to make air bypass the obstruction in sufficient amounts to sustain life. An attempt, at this stage, should be made to dislodge the foreign body with the fingers.

4. A physician should be consulted immediately, whether the ingested object is dislodged or not.

USAARDC WINS NSC HONOR AWARD

The U. S. Army Aberdeen Research and Development Center (USAARDC) has received a National Safety Council Award of Honor for outstanding safety accomplishments during FY 1970. The honor was accorded in April 1971 during a ceremony at the Center attended by civilian and military personnel of the USAARDC staff.

The above photo shows the award presentation made by MG Charles T. Horner, Jr., Chief of Staff, U. S. Army Materiel Command (fourth from left) to H. G. Buchanan, USAARDC Safety Director (center). Others pictured are COL Rudolph A. Axelson, Commanding Officer, USAARDC; Elmer A. Dieter (left), Human Engineering Laboratory, USAARDC; and Frank B. Hagan (right), Ballistic Research Laboratory, USAARDC.

During FY 1970, USAARDC amassed 2,673,512 civilian man-hours and 59,378 military man-days of exposure without a recordable accident. In addition, the Center has accumulated in excess of 6,000,000 accident-free man-hours since December 1968, the date of their last recordable injury.

BAFFLE-GAB THESAURUS

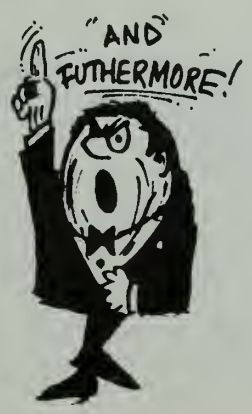
As any self-respecting bureaucrat knows, it is bad form indeed to use a single, simple word when six or seven obfuscating ones will do.

But where is the Washington phrasemaker to turn if he is hung up for what Horace called "words a foot and a half long?" Simple. Just glance at the Systematic Buzz Phrase Projector, or S.B.P.P.

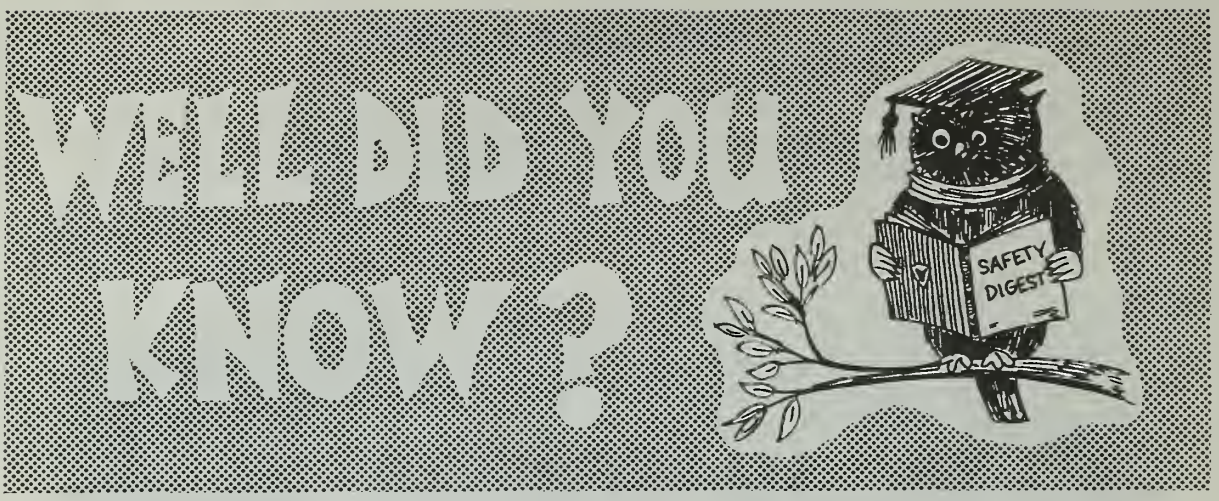
The S.B.P.P. has aptly obscure origins but appears to come from a Royal Canadian Air Force listing of fuzzy phrases. It was popularized in Washington by Philip Broughton, a U.S. Public Health Service official, who circulated it among civil servants and businessmen. A sort of mini-theasaurus of baffle-gab, it consists of a three-column list of 30 over-used but appropriately portentous words. Whenever a GS-14 or deputy assistant secretary needs an opaque phrase, he need only think of a three-digit number--any one will do as well as the next--and select the corresponding "buzz words" from the three columns. For example, 257 produces "systematized logistical projection," which has the ring of absolute authority and means absolutely nothing.

Broughton's baffle-gab guide:

	A	B	C
0)	Integrated	Management	Options
1)	Total	Organizational	Flexibility
2)	Systematized	Monitored	Capability
3)	Parallel	Reciprocal	Mobility
4)	Functional	Digital	Programing
5)	Responsive	Logistical	Concept
6)	Optional	Transitional	Time-Phase
7)	Synchronized	Incremental	Projection
8)	Compatible	Third-Generation	Hardware
9)	Balanced	Policy	Contingency



U. S. ARMY ADJUTANT GENERAL SCHOOL
Safety Management Division



Here are the answers to the questions on pages 32 and 33. A reference to the pertinent regulation and paragraph follows each answer.

1. Lighting fixtures in atmospheres containing explosives dust must not exceed a maximum surface temperature of 228°F. (109°C.) when operating at an ambient temperature of 80.6°F. (27°C.). Reference: Paragraph 6-14b, AMCR 385-100.

2. A minimum temperature of 40°F. shall be maintained in all areas protected by a wet-pipe sprinkler system except where anti-freeze systems are provided. Reference: Paragraph 12-25a, AMCR 385-100.

3. False. Explosives limits shall not be established on the basis of the maximum quantity of explosives allowable as defined by the existing quantity-distance separation to nearby exposures when lesser quantities of explosives will suffice for the operations. Reference: Paragraph 16-1b, AMCR 385-100.

4. Fire exit drills should be held not less than semi-annually relative to size of building and occupancy. Reference: Paragraph 12-34a, AMCR 385-100.

5. The safety director shall be a member of the Commander's staff. Should this not be the case, a waiver or exemption to the above requirement must be requested of the Commanding General, AMC, ATTN: Safety Office. Reference: Paragraphs 1-7 and 1-3b, AMCR 385-100.

6. The term "hangfire" is defined as the temporary failure or delay in the action of a primer, igniter or propelling charge. Reference: Paragraph 2-34, AMCR 385-100.

7. Temperatures used for melting explosives and keeping explosives molten shall not exceed 228°F. (109°C.) which corresponds to 5 p.s.i. saturated steam, except in the following cases (reference: Paragraph 26-4, AMCR 385-100):

a. Melting and keeping molten Composition B and similar binary explosives for which saturated steam pressures up to 15 p.s.i. (250°F., 121°C.) may be used if required by the established process.

b. Steam at pressures not in excess of 10 p.s.i. (240°F.) may be used for TNT core melting equipment.

8. Applications by AMC Government-owned, Government-operated (GOGO) installations and activities for National Safety Council no-injury record awards must be forwarded through command channels, to the Director, AMC Field Safety Agency, Charlestown, Indiana, for verification of exposure as well as other prerequisites mentioned in the NSC "Award Plan for Recognizing Good Industrial Records," 1 January 1966. Processing must be completed within 60 days after the completion of the record achievements. Reference: Paragraph 4f(4), AMCR 385-5.

9. Yes. Safety promotional material and posters not available from the AMC Field Safety Agency, for which a requirement is properly justified, should be procured locally with major subordinate command, installation, or activity funds without referral to Headquarters, AMC or the AMC Field Safety Agency. Reference: Paragraph 6, AMCR 385-8.

10. When trestle ladders are used for temporary scaffolding, the strength of the ladders shall be checked against the number of men the scaffolding will be required to hold; the total load to be carried; the height of the scaffold; and the span and size of planking between supporting trestles. Reference: Paragraph 9-36b, AMCR 385-100.

* * * * *

FIRE's DAILY TOLL

Statistics compiled by the National Fire Protection Association (NFPA) reveal that on any given day in the United States, fires take an average of 33 lives and strike 1,495 homes, 196 apartments, 26 school and college buildings, 10 churches, 22 hospitals and nursing homes, 111 farm buildings, 180 industrial plants, and 219 stores, restaurants, and office buildings.

Most of each day's fires are the result of ordinary human carelessness -- of failure to observe basic safety precautions. And most of these fires could be avoided.

DEPOT APPLICATIONS OF SYSTEM SAFETY

The application of system safety in the USAMC Depot complex is an area that, up to now, has been discussed primarily on an informal, unwritten basis. The information that follows is an attempt to briefly describe several portions of the subject that can provide benefits to the individual installation.

System safety can be effectively applied at the USAMC Depots. Consideration should be given to the use of this discipline in the areas outlined below as a minimum.

1. EIR/MWO System. Since depots have much contact with Army materiel, they can provide a valuable service to the developing agency (commodity command) by recognizing undesirable conditions arising through use, storage, rebuild and/or modification of equipment, and assuring that they are properly classified; i.e., "Emergency," "Urgent," "Routine," in equipment improvement recommendations (EIR's).

The depot safety offices are in an excellent position to assist in the preparation; i.e., classification, and evaluation of all EIR's initiated within the installation.

In applying modification work orders (MWO's), consideration should be given to the safety instructions; i.e., notes, cautions and warnings, contained therein. A complete evaluation of the job should also ask whether the MWO introduces new or additional hazards to either personnel or equipment.

Note that application of the above requires close coordination between the safety offices of both the developing command and depot.

2. Analysis of Operations. Currently it is common practice for depot safety offices to "sign off;" i.e., approve, standing operating procedures (SOP's) for work done on the installation. It is felt, however, that a need exists for a formal method, procedure or set of criteria which the safety office could use to evaluate the operation in detail before it is accomplished and which would serve as an aid in making a decision relative to approval of the work.

The techniques of system safety analysis can be applied in this situation. For example, consider an entire operation from receipt of starting materials to generation of finished product, as a system. It is then possible to ask:

a. "What happens if....?" What is the effect on the system if a component (individual task) fails in a particular mode or manner?

Another name for this approach is failure mode and effect analysis (FMEA). By examining all major components in their respective failure modes, it is possible to determine those areas that are the most hazardous; e.g., category III (critical) and IV (catastrophic) hazards as described in MIL STD 882. After a determination of individual operations which present critical and catastrophic hazards has been made, it is possible to go a step further by asking a second question.

b. "If this happens, how....?" In this case, the operation representing a category III or IV consequence determined as a result of FMEA, is analyzed to determine all the ways in which it could happen. This technique is known as fault tree analysis (FTA) and can be used to discover the independent failures that could cause the undesired event.

By using a methodology similar to that described above, the depot safety office can effectively review an operation and develop a workable criterion for its approval; e.g., approval is not granted until all class III and IV hazards have been eliminated or controlled to an "acceptable level."

3. Analysis in Other Areas. System safety analysis can also be applied in other areas.

a. Accident Investigation. The fault tree analysis would be especially beneficial in the determination of causal factors. Emphasis here should be directed toward discovery of deficiencies in the materiel. One should note the relationship between this point and the role that the safety office should play in the review and evaluation of EIR's.

b. Ammunition Peculiar Equipment. Since this is a hardware development program, the techniques of system safety analysis could be easily adapted.

Finally, in order to successfully implement these ideas at the depot level, it will be necessary for responsible personnel, both safety and others, to equip themselves with the "know-how" necessary to perform the duties outlined above. In this connection, strong consideration should be given to attending the System Safety Course held at the USAMC Field Safety Agency.

ABBREVIATIONS

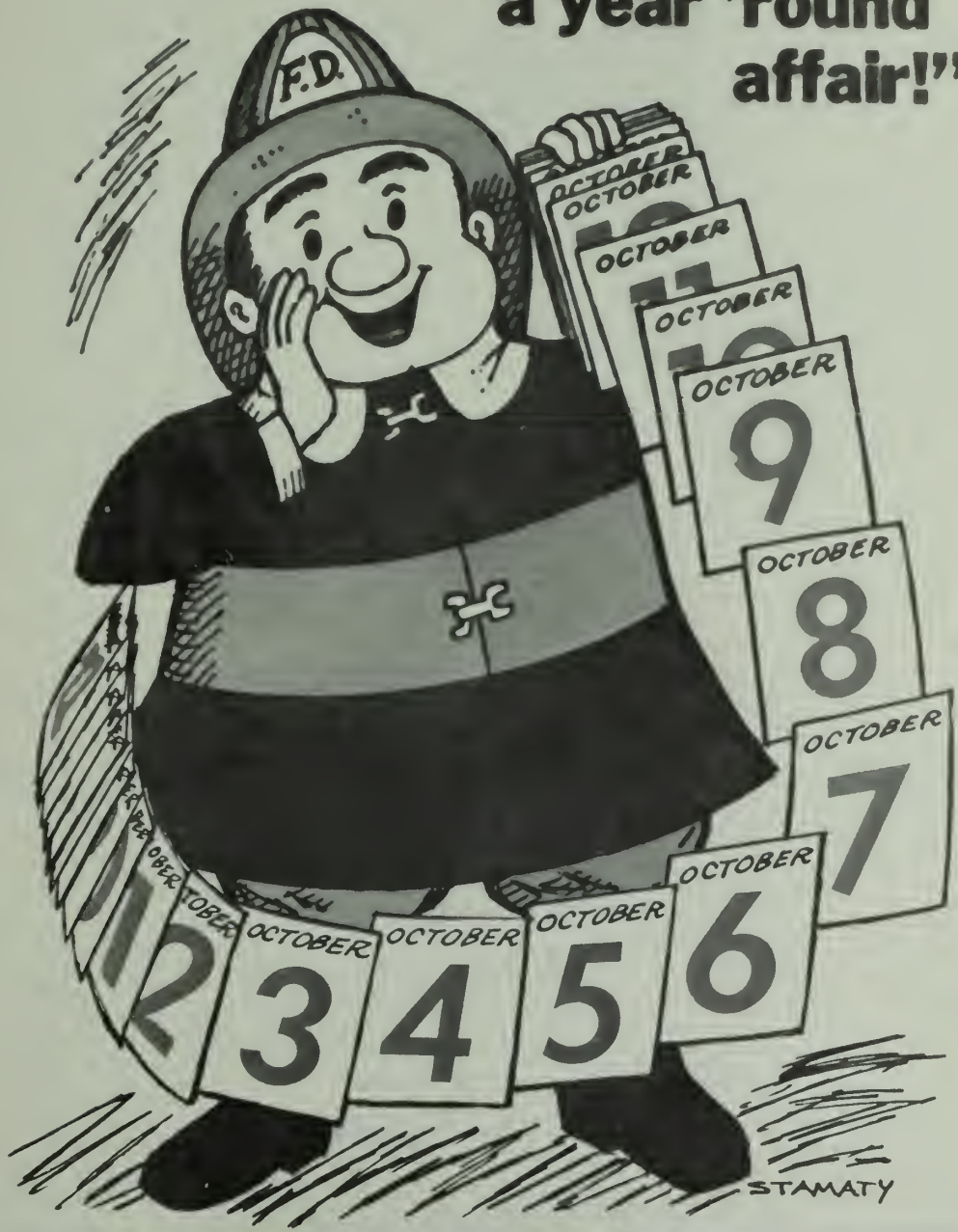
ADP	Advanced Development Plan
AFDP	Army Force Development Plan
AMP	Army Materiel Plan
APE	Advanced Production Engineering
ASOP	Army Strategic Objectives Plan
BOI	Basis of Issue
BOIP	Basis of Issue Plan
BTA	Best Technical Approach
CD	Contract Definition
CDP	Contract Definition Plan
CEI	Configuration End Item
CFP	Concept Formulation Package
COEA	Cost/Operational Effectiveness Analysis
DAT	Development Acceptance Test
DASSO	DA System Staff Officer
EDP	Equipment Distribution Plan
EDPS	Equipment Distribution and Planning Study
EDT	Engineer Design Test
ET	Engineer Test
FM	Field Manual
GFE	Government Furnished Equipment
IOC	Initial Operational Capability
IPR	In-Process Review
JLRSS	Joint Long Range Strategic Study
JSCP	Joint Strategic Capabilities Plan
JSOP	Joint Strategic Objectives Plan
MCA	Military Construction Army
MCP	Military Construction Plan
MN	Materiel Need
MN(ED)	Materiel Need (Engineering Development)
MN(P)	Materiel Need (Production)
MPE	Mission Performance Envelope
MRRC	Materiel Requirements Review Committee
MSP	Maintenance Support Package
NET	New Equipment Training
NETT	New Equipment Training Team
NICP	National Inventory Control Point
OCO	Operational Capability Objective
PAT	Production Acceptance Test
PCD	Program Change Decision
PCR	Program Change Request
PM	Project Manager
PMN	Proposed Materiel Need
PMO	Project Management Office
POI	Program of Instruction
PPCR	Preliminary Program Change Request
PSDP	Preliminary System Development Plan
QQPRI	Qualitative and Quantitative Personnel Requirement Information

RAS	Requirement Allocation Sheet
RFP	Request for Proposal
SD	System Description
SDP	System Development Plan
SSA	Source Selection Authority
SSAC	Source Selection Advisory Council
SSE	System Status Evaluation
SSEB	Source Selection Evaluation Board
ST	Service Test
TC	Type Classification
TM	Technical Manual
TOA	Trade-Off Analysis
TOD	Trade-Off Determination
TP	Technical Plan
USALDSRA	USA Logistrics Doctrine, Systems and Readiness Agency
WBS	Work Breakdown Structure
LCMM	"New" Life Cycle Management Model
CDC	Combat Development Command
CONARC	Continental Army Command
QMDO	Qualitative Materiel Development Objectives
QMR	Qualitative Materiel Requirements
SDR	Small Development Requirements
CD/MD	Combat and Materiel Developers
ADO	Advanced Development Objective
CEA	Cost Effectiveness Analysis
PDP	Proposed Development Plan
DDCP	Draft Development Concept Paper
CDOG	Combat Development Objectives Guide

* * * *

NOTES:

"Make FIRE PREVENTION a year 'round affair!"



FIRE PREVENTION WEEK · October 3-9

UNITED STATES ARMY MATERIEL COMMAND
WASHINGTON, D.C. 20315